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December 2001

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### Recommended Citation

Sasovova, Zuzana; Heng, Michael; and Newman, Michael, "Limits to Using ERP Systems" (2001). *AMCIS 2001 Proceedings*. 221.  
<http://aisel.aisnet.org/amcis2001/221>

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# LIMITS TO USING ERP SYSTEMS

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## Abstract

*The paper examines limitations that restrict the potential benefits from the use of Enterprise Resource Planning (ERP) systems in business firms. In the first part we discuss a limitation that arises from the strategic decision of top managers for mergers, acquisitions and divestitures as well as outsourcing. Managers tend to treat their companies like component-based business units, which are to be arranged and re-arranged to yet higher market values. Outsourcing of in-house activities to suppliers means disintegrating processes and information. Such consequences of strategic business decisions impose severe restrictions on what business organizations can benefit from ERP systems. The second part of the paper reflects upon the possibility of imbedding best practice business processes in ERP systems. We critically review the process of capturing and transferring best practices with a particular focus on context-dependence and nature of IT innovations.*

**Keywords:** Enterprise resource planning, business strategy, best practice

## Introduction

The paper examines the business environment and organizational conditions that limit the benefits from the use of Enterprise Resource Planning (ERP) systems in business firms. ERP systems purportedly offer “seamless integration of all the information flowing through a company – financial and accounting information, human resource information, supply chain information, customer information” (Davenport 1998). To achieve promised benefits from the implementation, we need to assume a more or less stable organization, which can be adequately modeled. The data, which are most essential for running the company, are properly documented and understood by the relevant users. Under such conditions, well-designed and implemented ERP systems complemented by useful business process redesign offer a basis to enhance organizational performance by imposing best business practices. By reflecting on these conditions we argue that there is a fundamental limitation to the exploitation of ERP systems’ benefits in business firms.

The first point arises from what may be termed the organizational level issues of ERP implementation. The issues treated at this level include the relation between the organization and environment, the role of strategy, organizational structure and culture. Specifically the limitation arises from the strategic decision of business firms for mergers, acquisitions and divestitures as well as outsourcing of non-core business activities. These are some of the commonly used strategic decisions taken by top managers to cope with the new business environment brought about by rapid technological change, keener competition and globalization.

The second point we will make in this paper is related to the concept of best business practices. ERP vendors sell the system as an innovation that allows an organization to easily buy-in best practices by adopting the system. Our critical review discusses theoretical problems with defining best practice in general and reflects upon the possibility of transferring best practice business processes with IT innovations such as ERP. The focus of the critique is on context-dependence and nature of IT innovations.

The second point may appear separate and different in nature from the limitation presented in the first part of the paper. But on closer examination, both points originate from the pressure on business organizations to perform. On the organizational level the pressure to perform results in mergers, acquisitions, divestitures and outsourcing. Within an organization the pressure to perform results in the drive to improve business processes and to improve efficiency through ‘best practice’. While the pressure on the organizational level results in problems with integration and disintegration of ERP systems, the pressure within the organization and the promise of best practice has been one of the drivers for ERP adoption. We argue that while on one level the pressure causes a limitation, on the other level it represents a case of unfulfilled promise.

The rest of the paper is structured as follows. The next section discusses the disruptions to integrated ERP systems that would result from strategic business decisions such as merger and outsourcing. This is followed by the section on the assumptions and

practice of introducing best practices during the implementation of ERP systems. The paper closes with a reflective discussion on the merits and roles of ERP in the context of our understanding of the meaningful and useful roles of IT in organizations.

## Changing Strategic Business Decisions

It is almost trite to say that business organizations are operating in a more demanding environment characterized by rapid technological change, pressure from shareholders, fierce competition, deregulation and globalization. Some methods commonly used by top managers to cope with these demands are mergers, acquisitions and divestitures as well as outsourcing. However, these top-level strategic decisions can severely limit the benefits that business organizations can enjoy from ERP systems. Below we discuss how these difficulties can arise, and then we reflect on a potentially huge market for systems dis-integrators and interface builders.

### *Mergers, Acquisitions and Divestitures*

Rightly or wrongly top managers in big companies have a tendency to treat their companies as consisting of component-based business units. The challenge for them is to arrange and re-arrange these pieces to yield higher value for their shareholders. If a re-arrangement results in a new configuration, with certain business units to be fitted somewhere else or sold off, so be it. In making such business deals, the top managers take a high level view. They correctly ignore, or consider as secondary, issues that would form some of the core concerns of information systems manager. Mergers and acquisitions are very often sold to the world on the argument of efficiency gains, synergy, and benefits from market domination, getting rid of redundancy, etc. Most of these arguments form a good basis for using ERP as a technological means to realize the gains. However, there are a few ways mergers and acquisitions can cause headaches.

Consider the predicament of one business firm (called BF) which is in the process of implementing an ERP system using SAP software. In the middle of the process, the IS manager is told that BF is involved in a merger scheme. After the merger, BF is asked to integrate its business activities with the merged partner using ORACLE software, which amounts to begin anew, this time using another software. In fact, BF could have fared worse if it had already implemented an ERP system. Larsen and Myers (1997) report exactly such a case. "Some three months after the 'go live date', however, news of a merger halted all further post-implementation work. This included the development of important user reports. Following the merger, the structures of Alpha NZ Ltd. were merged with those of the new owner and many of the new processes and structures 'undone.' A new information system was to be implemented by the end of 1997 to replace the SAP solution implemented as part of the BPR project (ibid: pp. 376-7)"

The second headache arises from divestitures. When a firm sells a business unit, it would normally sell off the information system of that business unit. A business unit sold would need to run its own information system. But what if that business unit is tightly integrated with the rest of the mother firm based on ERP technology. If integration is hard enough, disintegration is unlikely to be easier and it carries more risks. If an integration project is not proceeding well or fails in the end, the separate business units can still fall back on the old information systems. Such safety net is not available to the business units involved in a dis-integration project. And if that disintegration process runs against the wall, what would be the business consequences for the participating parties? "Given the pace of business integration and disintegration, today's strategies of internal system integration seem extraordinarily wasteful and ineffective. It has been said that the life of a business strategy is six months. What does it mean when it can take 18 months or more to achieve systems integration or disconnection? (Markus 2000b, p. 5)." A more dreadful scenario is that such difficulty in disentangling the connected information systems may blow an otherwise good strategic decision off the charted course.

### *Outsourcing of Existing Business Activities*

Another strategic decision concerns outsourcing of what is considered non-core business activities. In fact this management concept has been a motivating factor behind organizations to outsource their IS activities to ERP vendors (Markus 2000a). However, in the context of this paper, outsourcing can also work as a limit to adopting ERP systems. The source of the problem here is that what is perceived as an essential core activity today, say X, can become a non-core activity in two years' time.

Perhaps the most important characteristic of ERP is integration (Markus 2000a), covering most functional units from accounting, human resources management to logistics and production. At the time of planning and implementing the ERP applications, these activities are considered in-house. But with advances in knowledge and technologies, and changing market conditions, what is considered an in-house activity where the firm has competitive advantage may no longer be so in a few years' time. A common strategic decision is then to outsource that particular activity.

Consider a company that has successfully used ERP system to integrate the processes and information of its accounting, ordering, inventory control, production, human resources and other related activities. Three years later, it is found that an outside supplier can produce one of its traditional products of the same quality at a lower cost and *faster*. In order not to lose the market share, the company has to contract out the making of that product. But this strategic step has deep implications for the integrated information systems. This trend is unlikely to slow down, given the pressure exerted by the capital market (OECD 2000) and the increasing role played by network organization (Castells 2000).

Such strategic move of top managers represents a severe restriction on what IS managers can do with ERP systems. Given the extra investment in time, software and hardware, and personnel resources involved in designing and implementing ERP applications and changing them, it might be well nigh impossible to reap any benefit from an ERP project under such condition.

### ***A New Market Created for System Dis-integrators and Interface Builders***

The drive to integrate business processes and information has to contend with strategic business decisions of merger, acquisition and divestiture, and outsourcing. Here the logic of business organizations dictates that strategic decisions would have a bigger voice. With divestiture and outsourcing, what has been integrated has to be dis-integrated. With merger and acquisition, what has been integrated may have to go through the whole exercise of integrating with the new partner. This means that there is a huge potential market for systems dis-integrators. It would be an interesting research project to study the expertise, tasks, risks and responsibility, of the whole business of dis-integrating an ERP system.

Given the kinds of uncertainty for system integration that originate from business strategic decisions, one may do well to re-think the whole rationale behind integration that covers different business units, activities, processes and information. Perhaps it is better to define the boundary of what constitutes a business unit with its own activities, processes and information. Integration efforts should then be confined within this boundary. Integration with the rest of the holding company would be on the basis of standards, platform and interface. The standards would be influenced by the standard most commonly in use in that particular industry, the preference of its business partners and the holding. However, the decision as to the ultimate choice has to be in the hands of the business unit itself. With standards and platform chosen by the business unit, the vendors in the market can act like a disinterested third party that would go around building interfaces. Following this kind of thinking, interface would serve as a crucial element in integrating business units within a big business organization. Some degree of efficiency can well be lost. But the gains are in the area of flexibility for strategic decision-makers, in the joys of IT and IS people who do not have to suffer the nightmares of integration to be followed with dis-integration.

### **A Critical Look at the Idea of Best Practice**

The second part of the paper explores the notion of the best practice in business processes. ERP vendors sell the system as an innovation that allows an organization to easily buy-in 'best practices' by adopting the system. We will first reflect on the notion of best practice in general and then describe it in the context of business processes and ERP systems.

Best practice in business processes can be in general considered as theoretically problematic for two reasons. First of all, it is not possible to identify unequivocal frames of measurement of overall performance. The frames of measurement for assessing performance are relative to different stakeholders. Secondly, the priorities for achieving different criteria are not stable over time. Because it is not possible to perform well on all the criteria at the same time, organizations tend to shift their attention and focus on achieving different goals at different times (Cyert and March 1963).

In the context of ERP systems, the 'best practice' business processes are described, captured and transferred to an adopting organization in two stages. These two stages separate activities of a vendor and activities of an adopting organization and are primarily caused by the fact that ERP is packaged, standard software (as opposed to in-house developed software).

In the first stage the ERP system vendor works closely with key adopters of their ERP product, collects information from academic theory, and organizations such as APICS (association working on issues related to production and inventory control). On the basis of the gathered information, the vendor attempts to make the state-of-the-art functionality available in the respective modules of the ERP package they produce. In this way, ERP vendors claim to capture the best practice business processes in the ERP system so that adopters of ERP "benefit from advanced knowledge about how business processes *should* be done" (Markus 2000a).

In the second stage, the involved organizational members can choose a strategy with which they implement the ERP. Organizations can decide on the number of modules they are going to implement, which parts of the organization will be involved and the degree of autonomy vs. centralization given during the implementation (Davenport 1998; Markus et al. 2000).

Subsequently they can choose a configuration of the ERP system features and functionality based on the desired business processes. Then they try to implement the system and change the processes within the time and resource constraints of the implementation project.

In the process of capturing and transferring the best practices from the context of one organization with the help of ERP vendor to the context of another organization we assume that the embedded business practices are sufficiently generic and that the adopting organization's external environment and internal constraints will be such that the transfer will be beneficial in improving organizational performance of the adopter. However, except for the fact that there is no convincing evidence that would link performance improvements to the built-in best practices (Markus 2000a), Soh et al. (2000) provides evidence of the opposite, i.e. that the assumption of context-equality is far-fetched.

The degree of flexibility and rigidity of an ERP system has an influence on the transfer of best practices. A successful transfer of built-in best business practices contradicts with the possibility of configuration. As Markus (2000a) concludes, the possibility of ERP configuration offers a certain degree of flexibility at the cost of complexity. Adopters are challenged with hundreds or thousands of tables of ERP system parameters while the business implications of different configurations are not known. Although ERP vendors have advanced the interface to make parameterization easier (e.g. the module Customizing by SAP), the interface does not directly limit the choices. On the other hand, as many authors and practitioners conclude, ERP systems may offer seemingly high flexibility on the level of details of individual activities and transactions, but the main structure of the software is quite rigid (Bancroft et al. 1998; Davenport 1998). The question then is whether the rigid structure sufficiently reflects the crucial features of best practices that need to be transferred.

The major constraint to the successful transfer of best practices is the nature of the innovation. Although ERP systems have features of technological imperative (such as high-level rigidity, limited functionality), an organization has considerable discretion in deciding on the strategy and process of the implementation and as with other innovations in social contexts, unintended consequences of such decisions can emerge. The process of appropriation of innovation within an organization is complex, iterative, circuitous and both contextually embedded and socially shaped. In the words of Galliers and Swan (1999, p. 377): "Typically IT innovations are not easily definable, not easily imitable, inter-subjective (depending on tacit as well as formalized knowledge), and heavily context dependent." Previous research in information systems and organizational studies has demonstrated that technology introduced into an organization does not have deterministic consequences (Robey and Boudreau 1999). Rather, an implementation occasions a process of organizational restructuring where roles of organizational members can be redefined (Barley, 1986) and power relations shifted (Burkhardt and Brass, 1990). In this way the consequences of the process of ERP implementation (transfer of best practices) are difficult to predict and can have different short term and long term effects. Consider an example from the study of Larsen and Myers (1997) where the short run success of an ERP implementation project (64% reduction of headcount in accounting) had an unintended consequence in the form of social cost. During the implementation all original project team members resigned and the organization was left with low-skilled workforce with low morale.

To summarize, the possibility of adoption of best practice through simply implementing an ERP system is dubious and it may not be theoretically sound to try to achieve improvements in performance by merely copying generic (purportedly) best practice processes from other organizations. In other words, "it is in suppliers' interests to disseminate notions of 'best practice' (therefore you adopt it to survive), whereas it is to users' interests to design and customize new ideas so that they work within their own organization (Galliers and Swan 1999, p. 369)."

## Discussion and Conclusion

Toward the later stage of writing this paper Europe is in the grip of foot and mouth disease that has affected the livestock of farmers. Coming soon after the BSE or mad cow disease, the current outbreak casts a long shadow over the whole livestock industry. One reason why the foot and mouth disease has been able to spread so quickly is the way the whole production and delivery of animal meat is organized. The key concept is integration, and it comes with a heavy price. It dawns on the authors that somehow there is a limit to how far we can go with integration. The forces limiting such integration can be nature, taking the form of diseases, earthquake and tornadoes, or forces associated with social institutions such as market forces and the nature of organizational condition. In the case of integration using ERP systems, the limit assumes the form of strategic decisions of top management and the ambiguities and difficulties of implementing best practice.

For the sake of clarity, despite of the limitations described above, we are not resenting all ERP implementation efforts. Just like efforts for integration can lead to performance improvement, confrontation with 'best practices' even if they cannot be fully transferred from other organizations can make ERP adopters reflect on their own way of doing things, fundamentally rethink their own processes and can be a useful occasion for organizational learning. In the process of implementation "caches of organizational memory formerly guarded by division managers become transparent in the world of ERP, and enduring assumptions about responsibility, accountability, and the shared understandings about what it took to succeed are all challenged." (Robey et al. 2000, p. 36)

In general more evaluative research is needed to enhance our understanding of the implications of use of ERP systems. More specifically, both conceptual and empirical work is necessary that will relate ERP systems implementation (e.g. represented by the main characteristics of ERP: integration, standardization and process automation) to organizational consequences with as a final step the link to organizational performance. Such research can, among other things, bring an insight into the role 'best practices' and their transfer play in ERP implementations. Further, useful insights can be found in empirical work on the perceived degree of flexibility and rigidity of an ERP system as viewed by multiple stakeholders, focusing on the required degree of organizational change and development/transfer of 'best practices'. Lastly, shedding light on issues identified in the first part of this paper, it would be interesting to empirically research how organizations cope with new releases of ERP systems, the effort it takes to implement an ERP system that replaces a different ERP system, and the specific problems in ERP dis-integration.

By way of concluding the paper, we would like to reflect on the broader implication of use of ERP in both the theory and practice of information systems. It has been almost an article of faith in IS that IT should be used to support organizational goals and to enhance organizational flexibility. This idea is turned upside down by the use of ERP. "ERP implementations challenge established assumptions about the role of IT and how it is implemented. Whereas most firms had once built information systems around the requirements of their existing operational processes, most [ERP adopters] were concluding that big packages sometimes demanded that business processes adapt to assumptions built into the software. (Robey et al. 2000, p. 36)" Viewing the ERP phenomenon from the perspective of organizational development, we find another contradiction. Organizational development is built on the logic where information systems are subsumed to the needs of organizations. Again we see the logic inverted here. With ERP implementation, the information system is often put first, the organization *should* follow. "The notion that the organization is built around the package and not the other way round would have been regarded as putting the cart before the horse (Land 1999, p. 325)." As further research it would be rewarding to explore the implications of ERP for the conceptual development of information systems.

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